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The Dynamics of Housing Affordability

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Abstract

Shelter is the biggest expenditure most households make and its affordability can have an impact on the wellbeing of household members. For this reason, housing affordability is closely watched by a wide range of stakeholders—from housing advocates to policy analysts—interested in the welfare of Canadians. Measuring affordability involves comparing housing costs to a household's ability to meet them. One common measure is the shelter-cost-to-income-ratio (STIR). The 30% level is commonly accepted as the upper limit for affordable housing. Housing affordability is also a critical input to Canada Mortgage and Housing Corporation's core housing need indicator which is used by governments to help design, deliver, fund and evaluate social housing programs. The report, jointly authored by Statistics Canada and CMHC, focuses purely on the dynamics of housing affordability, not on core housing need. It examines the likelihood of spending 30% or more of household income on shelter, how often this occurs, whether it is occasional or persistent, and contrasts those spending 30% or more to those spending less. Cross-sectional estimates indicate that around 20% of Canadians lived in households spending more than the affordability benchmark in 2002. Longitudinally however, less than 9% lived in households that spent above the benchmark in each year between 2002 and 2004, while another 19% lived in households spending above the benchmark for either one or two years. The attributes associated with the highest probabilities of living in a household spending above the affordability benchmark were: living alone, being a female lone parent, renting, being an immigrant, or living in Vancouver or Toronto. In addition, those living in households experiencing some kind of transition between 2002 and 2004 period had a higher probability of exceeding the benchmark at least once during the period. Such transitions included renters with a change in rent-subsidy status, those who changed from owner to renter or vice versa, those who changed family type (for example, marrying or divorcing), and those who moved between cities. Notably, those experiencing these transitions did not exceed the benchmark persistently.

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1.0 Introduction

Shelter is the biggest expenditure most Canadian households make. Its affordability can have a big impact on their wellbeing. For these reasons, housing affordability is closely watched by a wide range of stakeholders – from housing advocates to policy analysts - interested in the housing and broader welfare of Canadians.

Measuring housing affordability involves comparing housing costs to a household's ability to meet those costs. The indicator underlying this measurement, the share of household income spent on shelter costs, is known as the Shelter cost-To-Income Ratio (STIR). A benchmark of 30% for the STIR is commonly accepted as the upper limit for defining affordable housing. Those who spend 30% or more of their household income have been, and continue to be, the subject of intense study. In particular, it is of interest to determine if they do so out of choice, through having the means and preference to spend more than the norm for housing, or out of necessity, being of low income and possibly in housing need.

Housing affordability, as measured by the STIR, is also a critical input to the core housing need indicator[1] developed by Canada Mortgage and Housing Corporation (CMHC) to identify households in housing need in Canada. The core housing need indicator "identifies those households unable to obtain market housing that is in adequate condition, of suitable size and, at the same time, affordable."[2] The resulting information is used by all three levels of government to help design, deliver, fund and evaluate social housing programs.

Up to now, all household income and shelter cost data used to calculate STIRs in Canada were cross-sectional in nature, thus describing housing affordability at a particular point in time. No data source followed households over time, collecting both their incomes and shelter costs, to enable the tracking of how their housing affordability evolved. That is not to say that data sources which surveyed households over time did not exist. Indeed, Statistics Canada's Survey of Labour and Income Dynamics (SLID) was designed to do just that: to enable, for example, the study of the dynamics of low income.[3] For the last five years CMHC has sponsored a module of questions on shelter costs on this survey and now information from this module enables us to review housing affordability on a longitudinal basis for the first time.

This report, written jointly by Statistics Canada and CMHC, focuses purely on the dynamics of housing affordability, and not on housing need. It examines the likelihood of spending 30% or more of household income on shelter, how often this occurs, whether

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1. Core housing need refers to those whose housing is over-crowded, in need of major repairs, or costs 30% or more of household income AND who could not afford to rent adequate, suitable and affordable housing in their local housing market for less than 30% of total before-tax household income. CMHC is conducting separate research using SLID to examine core housing need.
2. Core Housing Need in Canada, 1991, Canada Mortgage and Housing Corporation. Pg 1
3. Morrisette R. and X. Zhang's (2001) "Experiencing low income for several years", Perspectives, Vol. 2, No. 3, March 2001, Statistics Canada, Catalogue no. 75-001-XIE.

it is occasional or persistent, and contrasts the characteristics of those spending 30% or more to those spending less.

The report demonstrates the analytical capability of the longitudinal housing data on SLID to enhance what we know about Canadians spending 30% or more of their total before-tax household income on shelter. SLID cross-sectional estimates show that around 20% of Canadians were living in households spending 30% or more of their income on shelter in any single year between 2002 and 2004. Looking at this same time period longitudinally, the numbers tell us that 9% lived in households that exceeded the affordability benchmark for all three years and 19% lived in households that exceeded the benchmark for one or two years. Thus, 28% *ever* experienced this situation (9% *persistently* and 19% *occasionally*) and 72% *never* experienced it over the three year study period. This paper exploits the longitudinal capability of SLID data to examine the socio-economic and geographic characteristics of those who *ever* (at least one year) spend 30% or more of income on shelter and those who *persistently* spend 30% or more during the three-year period between 2002 and 2004.

Section 2 presents a descriptive profile that uses both cross-sectional and longitudinal data to describe Canadians spending above the affordability benchmark. Section 3 models the likelihood of Canadians living in a household *ever* or *persistently* spending more than the housing affordability benchmark. Section 4 draws conclusions from the report and provides some suggestions for further research.[4] Background information on SLID, and definitions of the study universe, shelter costs, household income, and the housing affordability standard employed in this research are found in Appendices A through C. Appendices D to F present information about the models.

The addition of the housing module on SLID by CMHC has resulted in a longitudinal data source for housing research which should be of interest to housing policy analysts. We hope that this report will give some indication of the possibilities and stimulate further research.

2.0 Housing affordability profile

2.1 Longitudinal estimates show dynamics of housing affordability

Cross-sectional estimates indicate that around 20% of Canadians (5.5 million) lived in households spending more than the affordability benchmark on shelter costs in 2002. Similar estimates are found for 2003 and 2004 (table 1).

SLID longitudinal data provide a different perspective by estimating the number of people exceeding the benchmark over a period of time. They indicate that 8.6% of Canadians (2.1 million) were living in households that persistently spent above the

4. As noted in footnote 1, CMHC is conducting SLID core housing need research to develop estimates of, and track high level trends in, core housing need between censuses.

affordability benchmark between 2002 and 2004, while another 19% (almost 4.9 million) lived in households occasionally spending above the benchmark. In total then, about 28% (7.0 million) lived in households that *ever* exceeded the affordability benchmark during the study period. (table 2) This proportion is considerably higher than the 19% of people doing so in any single year.

Table 1 Cross-sectional estimates of the number of people living in households exceeding the affordability benchmark

Shelter-cost-to-income-ratio (STIR)	2002		2003		2004	
	'000	%	'000	%	'000	%
Less than 30%	22,872	80.6	23,036	80.4	23,131	80.0
30% or more	5,507	19.4	5,611	19.6	5,780	20.0
Total	28,379	100.0	28,647	100.0	28,912	100.0

Table 2 Longitudinal estimates of the number of people living in households exceeding affordability benchmark

	Never	Ever			Total
		Occasionally		Persistently	
Number of years spending 30% or more of income on shelter costs	0	1	2	3	...
People (thousands)	17,987	3,114	1,756	2,154	25,011
People (percent)	71.9	12.4	7.0	8.6	100

... not applicable

2.2 Low-income households are more likely to spend above the housing affordability benchmark

Household income is a key determinant of STIRs. On average, income-constrained households have higher shelter cost burdens and are more likely than others to spend more than the housing affordability benchmark. In fact, SLID data confirm that, in 2002, over 80% of people living in households exceeding the affordability benchmark fall into the two bottom quintiles and hence are of low or modest income (tables 3a, 3b, 3c). In contrast, those with incomes in the top two quintiles account for only about 6% of all people exceeding the affordability benchmark. This group likely spends above the benchmark out of choice as opposed to necessity.

Nearly 57% of people in the lowest income quintile live in households spending more than the affordability benchmark. Their median STIR, at almost 50%, tends to be a

consequence not only of their low income levels but also their relatively high shelter costs[5]. A variety of reasons exist for having high shelter costs. For owners it may be high mortgage payments – once mortgages are paid off, STIRs naturally drop considerably. Renters may find that, unless they are in subsidized housing, there is a floor to rents below which accommodation cannot be obtained. In addition, families in this situation may live in cities with more expensive housing, need a bigger dwelling to accommodate a larger family, or lack the resources (social or financial) to search out less expensive accommodation.

Table 3a People living in households spending above and below the affordability benchmark by income quintile[1,2], cross-sectional, 2002

Shelter-cost-to-income-ratio (STIR)	Share within income quintile	Cumulative share of people spending 30% or more	Median shelter cost	Median household income	Median Shelter-cost-to-income-ratio
	%	%	$	$	%
Lowest income quintile					
30% or more	56.6	58.4	8,362	17,018	49.8
less than 30%	43.4	...	4,019	23,311	19.9
Second income quintile					
30% or more	23.3	82.4	14,759	37,789	37.9
less than 30%	76.7	...	6,347	39,637	16.4
Third income quintile					
30% or more	10.9	93.6	21,348	57,367	36.4
less than 30%	89.1	...	8,937	59,230	15.1
Fourth income quintile					
30% or more	4.8	98.5	28,991	78,062	35.6
less than 30%	95.2	...	11,139	82,992	13.4
Highest income quintile					
30% or more	1.4	100.0	41,196	111,344	36.0
less than 30%	98.6	...	13,097	128,195	9.4

... not applicable

1. Household income not adjusted for inflation or by family composition and size
2. Upper bounds in current dollars for quintiles 1 to 4 respectively are: $29,976; $49,062; $70,214; $99,919

5. Median Shelter-cost-to-income-ratio (STIRs) in this report include households with STIRs equal to or greater than 100%. Overall, roughly 3% of households have such STIRs. However, since a given income quintile (or other sub-population) may have a higher or lower percentage, the effects of this inclusion may vary. Normally, CMHC excludes these households from its affordability studies since it is difficult to interpret their financial circumstances. Possible reasons for STIRs being greater than 100% include: different reference periods for shelter and income; the collection of shelter costs that seem too high (perhaps because, if there is a business operated from home, there is difficulty separating shelter costs from business expenses); fluctuations in self-employment income; and the household having revenue other than standard income to put towards shelter.

Table 3b People living in households spending above and below the affordability benchmark by income quintile[1,2], cross-sectional, 2003

Shelter-cost-to-income-ratio (STIR)	Share within income quintile	Cumulative share of people spending 30% or more	Median shelter cost	Median household income	Median Shelter-cost-to-income-ratio
	%	%	$	$	%
Lowest income quintile					
30% or more	56.9	58.0	8,808	17,319	50.6
less than 30%	43.1	...	4,358	24,280	20.6
Second income quintile					
30% or more	23.6	82.2	15,229	39,128	38.1
less than 30%	76.4	...	6,622	40,765	16.7
Third income quintile					
30% or more	11.3	93.7	22,512	59,323	36.0
less than 30%	88.7	...	9,273	61,259	15.2
Fourth income quintile					
30% or more	4.9	98.8	31,333	82,456	36.1
less than 30%	95.1	...	12,000	85,370	14.2
Highest income quintile					
30% or more	1.2	100.0	45,033	120,786	36.4
less than 30%	98.8	...	13,939	130,770	10.0

... not applicable

1. Household income not adjusted for inflation or by family composition and size
2. Upper bounds in current dollars for quintiles 1 to 4 respectively are: $30,875; $50,290; $72,042; $102,488

Table 3c People living in households spending above and below the affordability benchmark by income quintile[1,2], cross-sectional, 2004

Shelter-cost-to-income-ratio (STIR)	Share within income quintile	Cumulative share of people spending 30% or more	Median shelter cost	Median household income	Median Shelter-cost-to-income-ratio
	%	%	$	$	%
Lowest income quintile					
30% or more	57.9	57.4	9,000	17,417	51.0
less than 30%	42.1	...	4,416	24,742	20.1
Second income quintile					
30% or more	23.5	80.6	15,983	39,887	39.3
less than 30%	76.5	...	6,720	41,625	16.5
Third income quintile					
30% or more	12.7	93.2	23,233	62,323	36.0
less than 30%	87.3	...	9,426	62,949	15.0
Fourth income quintile					
30% or more	5.2	98.3	31,258	87,196	34.6
less than 30%	94.8	...	12,104	88,671	13.7
Highest income quintile					
30% or more	1.7	100.0	44,570	124,383	35.2
less than 30%	98.3	...	13,823	135,885	9.6

... not applicable

1. Household income not adjusted for inflation or by family composition and size
2. Upper bounds in current dollars for quintiles 1 to 4 respectively are: $31,580; $51,716; $74,388; $106,209

While the most obvious reason for low household income is having a low-paying job, there are also other causes. These include: having only one earner, family breakup, job loss, and business or investment losses that are larger than income received (especially for the self-employed). Some households with low income may have other sources of revenue such as capital gains, savings, bursaries, loans, gifts and even charitable support.

Table 4 People living in households spending above and below the affordability benchmark by income quintile[1,2], longitudinal, 2002 to 2004

Period exceeding shelter-cost-to-income-ratio (STIR)	Share within income quintile	Median shelter cost	Median household income	Median Shelter-cost-to-income-ratio (STIR)
Lowest income quintile	%	$	$	%
Less than 30% all 3 years	37.3	4,216	27,341	17.9
30% or more 1 or 2 years	32.4	7,195	24,113	32.2
30% or more all 3 years	30.2	9,920	19,109	52.7
Second income quintile				
Less than 30% all 3 years	62.8	6,413	44,756	14.9
30% or more 1 or 2 years	29.5	12,205	43,652	30.2
30% or more all 3 years	7.8	18,491	42,166	43.2
Middle income quintile				
Less than 30% all 3 years	77.5	9,118	64,239	14.5
30% or more 1 or 2 years	18.9	16,375	62,604	28.0
30% or more all 3 years	3.7	24,907	63,138	39.1
Fourth income quintile				
Less than 30% all 3 years	86.2	11,663	88,763	13.6
30% or more 1 or 2 years	12.7	21,184	84,724	26.7
30% or more all 3 years	1.1	33,136	86,870	35.6
Highest income quintile				
Less than 30% all 3 years	95.8	13,861	131,817	10.3
30% or more 1 or 2 years	3.9	29,552	126,971	26.2
30% or more all 3 years	0.3	39,885	113,379	35.2

1. Household income not adjusted for inflation or by family composition and size.
2. Upper bounds in current dollars for quintiles 1 to 4 respectively are: $34,665; $54,258; $75,174; $104,320.

In addition, some of these reasons for high shelter costs and low household incomes resulting in high STIRs are only transitory. Finding a job, getting married or moving are examples of events that could lower the STIR. SLID longitudinal data enable us to identify households that made these transitions and track their movements above and below the benchmark over the period of study.

Table 4 presents estimates similar to tables 3a 3b and 3c but from a longitudinal perspective, not a cross-sectional one. This means that, instead of considering whether people are in households above or below the affordability benchmark at a given point in

time, table 4 shows whether they are above or below the benchmark for one, two or three years out of the three-year study period.

Like cross-sectional estimates, longitudinal numbers show that as household income increases, a lower percentage of people live in households that ever spend above the affordability benchmark. However, longitudinal estimates of the percentage of people living in a household ever spending above the benchmark are higher than cross-sectional percentages, regardless of income quintile. As would be expected, over a longer period of time, more people live in households that spend above the affordability benchmark.

The comparison also reveals that the higher the income quintile, the wider the percentage difference between the longitudinal and cross-sectional estimates. (table 5). As household income increases, there is a much larger turnover or change in those living in households spending 30% or more of household income on shelter. People in higher income quintiles who ever live in households spending above the benchmark simply do not tend to do so repeatedly or persistently. Instead, new people are entering as others are leaving the group from one year to the next, which leads to higher longitudinal than cross-sectional estimates.

Table 5 Comparison of percentages of persons ever above the affordability benchmark, cross-sectional and longitudinal

Quintile	2002 (exceeding affordability benchmark)	Longitudinal (2002 to 2004) (ever exceeding affordability benchmark)	Difference	Difference expressed as percentage of longitudinal estimate
	%	%	Percentage points	%
Lowest	56.6	62.6	6.0	9.6
Second	23.3	37.3	14.0	37.5
Middle	10.9	22.6	11.7	51.8
Fourth	4.8	13.8	9.0	65.2
Highest	1.4	4.2	2.8	66.7

Another way of looking at this is to examine the share of those persistently (all three years) exceeding the affordability benchmark during the three-year period compared to those ever exceeding it (at least one year). In the lowest quintile, almost half of those ever exceeding the benchmark did so for all three years. In contrast, only 7% of those in the highest quintile did so. (The percentages for the second, third and fourth quintiles are 21%, 16% and 8% respectively.) Thus, the higher the income quintile the larger the proportion of people moving back and forth across the affordability benchmark, indicating that the causes of exceeding the benchmark may often be temporary. But for the lower income quintiles, especially the lowest, there is a much higher proportion of people whose STIRs persistently exceed the benchmark, indicating that they are less able to adjust their incomes or shelter costs.

2.3 Who exceeds the affordability benchmark most often cross-sectionally and longitudinally?

As would be expected, results confirm the fact that a higher proportion of renters spend above the affordability benchmark, (table 6). In 2004, roughly one-third of renters (paying either market or subsidized rent) lived in households spending above the affordability benchmark, well over the percentages of 23% for owners with mortgages and 4% for owners without mortgages. Longitudinally, well over 40% of renters ever exceeded the affordability benchmark over the 2002-2004 study period, a much higher proportion than for owners. Meanwhile, those living in households that changed tenure during this period were much more likely ever to exceed the benchmark but less likely to exceed it persistently. This seems to indicate that changing tenure could be associated with temporary affordability difficulties. The study period is, however, too short to have a good understanding of all the dynamics and a few more years are required to gain a better understanding.

Results confirm findings from the Census, Survey of Household Spending and Survey of Financial Security that female lone-parent families and those living alone are the most likely to spend above the affordability benchmark at 44% and 42% respectively in 2004. The proportion of people exceeding the affordability benchmark in each of those groups was more than double the proportion in the population as a whole (20%). Those living alone must pay the entire cost of shelter themselves and rely on whatever income they alone can generate. Those supporting children alone face the double challenge of having only one income and needing to pay for larger accommodation.

Those whose family type changed over the study period are among the most likely ever to spend above the benchmark (39%). As with tenure-changers, this group may not remain long in this state since their three-year rate (7.1%) is below the national average.

Other attributes such as number of years since immigration, visible minority status, and some geographical locations also seem to be associated with higher rates of ever or persistently exceeding the affordability benchmark. Recent immigrants in particular had notably higher percentages exceeding the benchmark, both cross-sectionally and longitudinally. These percentages declined as the length of time in Canada increased.

Geographically, Vancouverites were more likely to live in households exceeding the benchmark, with 33% doing so in 2004 and 44% ever exceeding the affordability benchmark over the three-year study period. Similar to those who changed tenure or family type over the study period, a relatively high percentage (41%) of those who changed place of residence exceeded the affordability benchmark at least once during the three-year period. But the higher STIRs associated with the change in residence seem to be temporary, since only 6.6% persistently exceeded the affordability benchmark, well below the national average of 8.6%.

More years of data will be required before strong conclusions can be reached. The rest of this report will start to examine the relationships between these socio-economic variables

and housing affordability. Via two regression models, it isolates the individual influence of socio-economic characteristics to explain high probabilities of ever and persistently exceeding the affordability benchmark.

Table 6 Cross-sectional and longitudinal rates of exceeding the affordability benchmark, 2002 to 2004

Characteristics	Cross-sectional			Longitudinal	
	2002	2003	2004	Ever	Persistently
			percent		
All population	**19.4**	**19.6**	**20.0**	**28.1**	**8.6**
Gender					
Female	20.3	20.6	20.8	29.7	9.6
Male	18.5	18.6	19.2	26.5	7.6
Age group					
00 to 19	21.5	21.5	21.9	30.7	9.8
20 to 29	21.3	21.6	21.7	33.1	6.5
30 to 49	19.3	19.9	20.3	28.1	8.7
50 to 64	16.9	16.9	17.7	23.5	7.9
65 and more	16.8	17.0	16.9	24.4	9.3
Tenure					
Owners – with mortgage[1]	21.5	22.0	23.1	30.5	10.2
Owners – without mortgage[1]	3.5	3.6	4.0	5.9	1.1
Owners – with a change in mortgage status	...	...	...	24.9	0.8
Renters – market[1]	32.0	38.4	34.3	43.1	19.2
Renters – subsidized[1]	33.9	32.7	33.1	45.1	15.1
Renters – with a change in rent subsidy status	...	...	...	56.4	24.3
Changed tenure	...	...	...	42.8	6.5
Geography					
Ottawa-Gatineau[1]	16.1	20.6	19.4	23.8	7.3
Toronto[1]	23.9	25.2	28.9	36.0	11.9
Vancouver[1]	30.7	30.3	33.1	44.0	16.4
Montreal[1]	20.8	17.2	17.4	25.3	9.0
Calgary[1]	15.3	21.3	18.6	26.8	8.1
Edmonton[1]	16.7	16.4	13.7	24.9	5.5
Victoria[1]	22.2	23.5	21.7	30.5	8.8
Other CMAs[1]	18.0	17.9	17.3	24.8	7.5
Rural[1]	13.4	14.1	14.8	20.5	5.7
Moved between these places	...	...	...	41.4	6.6

See note at end of table

Table 6 Cross-sectional and longitudinal rates of exceeding the affordability benchmark, 2002 to 2004 (continued)

Characteristics	Cross-sectional			Longitudinal	
	2002	2003	2004	Ever	Persistently
			percent		
Family Type					
Married couple with no children[1]	11.7	11.8	11.6	16.0	4.2
Married couple with children[1]	15.8	16.5	17.5	24.3	7.3
Unattached individual[1]	40.9	41.3	41.6	46.9	22.9
Female lone parent[1]	48.6	45.2	44.2	57.4	27.6
Male lone parent[1]	27.8	24.8	27.4	25.7	12.8
Other family type[1]	17.7	18.2	18.5	23.6	5.3
Changed family type	...	...	...	38.6	7.1
Disability					
Yes	23.1	22.6	23.4	30.1	10.5
No	17.5	17.8	18.1	25.8	6.8
Aboriginal					
Yes	23.6	25.2	23.4	36.7	10.4
No	18.6	18.7	19.1	27.0	8.0
Visible minority					
Yes	28.6	29.8	31.3	43.7	13.2
No	17.4	17.4	17.6	25.1	7.4
Years since immigration (as of 2002)					
0 to 9	36.5	36.9	37.6	54.0	17.3
10 to 19	27.7	31.4	33.1	39.5	14.1
20 to 29	24.2	23.0	25.1	35.7	10.3
30 to 39	19.0	16.4	19.2	24.6	7.8
40 and more	14.4	16.7	14.5	22.3	6.8
Non-immigrant	18.4	18.5	18.8	26.7	8.1
Education					
Below high school	20.6	20.9	20.8	29.4	9.5
Graduated high school	18.7	18.8	19.8	27.6	8.1
Some PSE without cert	21.1	21.1	20.8	30.1	9.1
Some PSE with cert	16.8	16.9	17.9	25.3	7.3
Bachelor's degree	14.0	15.3	14.4	21.1	5.5
Postgraduate degree	15.4	12.3	13.7	19.3	5.2

... not applicable

1. All three years for longitudinal estimates

3.0 Who is more likely to spend 30% or more of income on shelter costs?

This section explores this question using two regression models. The first compares the characteristics of those who *ever* spent 30% or more of their household income on shelter costs for at least one year during the study period to those who never did. The second

model compares those who *persistently* (for all three years) spent above the benchmark to those who had at least one year where they were below it (the never plus occasionally group as per table 2). Appendix D provides more information on the distribution of the sample for each of these models and Appendix E has information about the variables used in the models.

3.1 Average Canadian has one in five probability of living in a household spending 30% or more for shelter

The first model predicts that the average[6] Canadian has a probability of about one in five (21%) of ever living in a household spending 30% or more of income on shelter over the three-year study period. However, the probability (based on the second model) of this average Canadian living in a household that persistently exceeds the affordability benchmark is much lower at 3.9%.

Note that these probabilities differ from the percentages presented in table 6 in the previous section. Table 6 presents the percentages of the population with various characteristics that exceeded the affordability benchmark during the study period. On the other hand, table 7 presents the probabilities of ever or persistently exceeding the affordability benchmark for populations with various characteristics if all other characteristics (as included in the model) are held constant. The model helps us to isolate the effect of a single characteristic at a time. See Appendices D, E and F for more information about the models.

Individuals and families living through changes affecting their incomes or shelter costs see corresponding changes in their STIRS and hence, their probabilities of ever or always spending 30% or more of their incomes on housing. Movers, those who change tenure, and those whose family situation changes (perhaps through divorce, marriage or other family changes) are particular examples of those whose circumstances have changed and they are featured in the discussion below.

Age is not a strong factor in determining the probability of ever spending 30% or more on shelter costs. None of the age groups in the first model had probabilities significantly different from the reference category (age 30-49) of ever having a STIR of 30% or more. For the second model, only the 20-29 age group had a significantly lower probability from those aged 30 to 49 of persistently exceeding the affordability benchmark. However, even though this difference was significant, it was not substantially lower. Perhaps there are a variety of reasons why the 20 to 29 year age group was significantly different from the reference category. This is a group in transition. Some still live at home with their parents and therefore their shelter costs and income reflect their family's situation rather than their own. Those who have moved out may be saving to buy a house and live in inexpensive accommodation to do so. If they have not yet started a family, they will not need the larger, more expensive accommodation required by families. Note that, while many in this age group share accommodation with roommates, these

6. By setting all model variables to their mean value, we can mimic an "average" Canadian in the sample.

households are excluded from this study and this should be kept in mind when interpreting the results presented here.

Table 7 Probability of people exceeding the affordability benchmark (shelter-cost-to-income-ratio (STIR) ≥ 30%)

Characteristics[1]	Ever: At least one year	Persistently: All three years	Share of the adult population
	probability	probability	%
National average	**21.3**	**3.9**	**100.0**
Age group			
16 to 19	19.7	3.1	6.3
20 to 29	21.7	2.8 [2]	15.0
30 to 49 (reference group)	20.9	3.9	41.6
50 to 64	21.5	4.6	22.5
65 and more	22.6	4.7	14.6
Tenure			
Owners – with mortgage	34.2 [2]	10.3 [2]	35.7
Owners – without mortgage	5.2 [2]	0.8 [2]	27.4
Owners – with a change in mortgage status	25.7 [2]	0.8 [2]	8.6
Renters – market (reference group)	33.3	11.9	13.4
Renters – subsidized	29.7	5.5 [2]	2.1
Renters – with a change in rent subsidy status	38.9	12.1	3.1
Changed tenure	35.4	4.8 [2]	9.7
Geography			
Ottawa-Gatineau (reference group)	18.9	3.2	3.5
Toronto	26.4 [2]	5.4 [2]	15.1
Vancouver	31.6 [2]	7.0 [2]	6.4
Montreal	16.9	3.4	10.9
Calgary	19.9	3.4	2.8
Edmonton	20.7	2.8	3.0
Victoria	28.0 [2]	4.3	0.9
Other CMAs	19.9	3.7	42.8
Rural	18.6	3.4	10.4
Moved between these places	28.0 [2]	3.2	4.2
Family type			
Couple family (reference group)	15.8	3.0	66.1
Men living alone	39.6 [2]	11.0 [2]	4.2
Women living alone	48.2 [2]	16.3 [2]	6.5
Female lone parent	44.9 [2]	13.8 [2]	2.3
Other family type (includes male lone parents)	23.6 [2]	3.5	7.6
Changed family type	34.9 [2]	4.3 [2]	13.3
Disability			
Yes	24.1 [2]	4.9 [2]	36.5
No (reference group)	19.8	3.4	63.5

See note at end of table

Table 7 Probability of exceeding the affordability benchmark (shelter-cost-to-income-ratio (STIR)≥ 30%) (continued)

Characteristics[1]	Ever: At least one year	Persistently: All three years	Share of the adult population
	probability	probability	%
National average	**21.3**	**3.9**	**100.0**
Aboriginal			
Yes	27.6 [2]	4.8	3.0
No (reference group)	21.1	3.9	97.0
Visible minority			
Yes	27.1 [2]	4.8	11.7
No (reference group)	20.6	3.8	88.4
Years since immigration (as of 2002)			
0 to 9	39.2 [2]	8.3 [2]	4.2
10 to 19	26.6 [2]	6.2 [2]	4.1
20 to 29	26.8 [2]	4.6	3.0
30 to 39	23.9	4.8	3.2
40 and more	23.0	3.4	3.6
non-immigrant (reference group)	20.0	3.7	81.8
Education			
Below high school	25.0 [2]	4.8 [2]	21.5
Graduated high school	23.2 [2]	4.1	14.6
Some PSE w/o cert	22.3 [2]	4.8 [2]	12.0
Some PSE w/ cert (reference group)	19.5	3.4	26.9
Bachelor's degree	14.7 [2]	2.5 [2]	9.7
Postgraduate degree	12.6 [2]	2.1 [2]	4.9
Unknown	27.7 [2]	5.5 [2]	10.4

Note: The probabilities of ever and persistently spending above the affordability benchmark for each socio-economic variable are calculated holding all other socio-economic variables used as regressors to their averages. For instance, when looking at the effect of gender, the probability of ever and persistently exceeding the affordability benchmark is calculated based on the average values of all explanatory variables other than gender (e.g., age, tenure characteristics, family composition).

1. Significantly different from the coefficient of the reference group at the 5% level. Probabilities without the superscript "1" are not significantly different from the reference group even though they have different values.
2. For Tenure, Geography and Family Type, the characteristics describe a situation as it existed for all three years. When people lived in a family that changed from one category to another, a separate category (or categories) has been created.

3.2 Subsidized renters have a significantly lower probability than market renters of persistently spending 30% or more for shelter

Past Census results have shown that on average, renters have higher STIRs than owners and are more likely to spend 30% or more of their incomes on shelter. Since this study looks at a three-year period, the typical owner-renter groupings have been expanded. The tenure variable used in this report groups owners by whether they have mortgages or not, and renters by whether they pay market or subsidized rent. Persons in each of these four groups did not change their situations during the full three-year period. Separate categories are provided for owners who added or discharged a mortgage, for renters who moved from paying market rent to subsidized rent or vice versa, and for those who changed from renting to owning or vice versa. Table 7 shows the share of the study population living in each of these tenure situations.

The reference category in the model is renters who paid market rent all three years. Considering previous experience with Census information, we would expect owners generally to be in more affordable situations, and to be less likely than market renters to have STIRS of 30% or more. Similarly, we would expect mortgage-free owners to be in more affordable situations than those with mortgages. And we would anticipate that subsidized renters would be in more affordable situations than if they were paying market rent.

The model results support our expectations and allow for a more in-depth understanding of the role that tenure plays in housing affordability. In table 8, the tenure categories are arranged in descending order based on their median STIR.

Renters have the highest median STIRs. They are also the most likely ever to spend above the affordability benchmark and, with the exception of subsidized renters, persistently to spend above this benchmark. The results of the first model show that, for market renters, the probability of ever spending 30% of household income or more on shelter is one in three. The probability drops to one in eight for persistently spending above this benchmark and is even lower for subsidized renters at one in eighteen. This is in spite of the fact that the median income for subsidized renters is only half that of market renters. Thus, the results of the second model provide additional evidence that rent subsidies are having an effect.

While it may seem counterintuitive that subsidized renters have higher STIRs than market renters, they would be much higher without rent subsidies. If subsidized renters had paid the median market rent of $8,301 rather than their subsidized rent, their median STIR would have been 42% instead of 26%. The median shelter costs of renters subsidized for all three years are 40% below those of market renters. This helps to make their shelter costs much more affordable when compared to their very low median incomes.

Table 8 Median shelter-cost-to-income-ratio (STIR), shelter cost and income by tenure category, 2002 to 2004

Tenure	Median shelter-cost-to-income-ratio	Median shelter cost	Median household income
	%	$	$
Renters – with a change in rent subsidy status	27.0	7,146	27,445
Renters – subsidized all 3 years	26.4	5,004	19,547
Renters – market all 3 years	22.5	8,301	39,572
Changed tenure	20.1	9,975	54,984
Owners – with mortgage all 3 years	19.6	15,282	79,306
Owners – with a change in mortgage status	13.1	9,456	76,080
Owners – without mortgage all 3 years	7.8	4,817	62,413

Note: Estimates based on the household records of people that were used in the model who were present for all three years of the study period, lived in households with incomes and shelter costs greater than zero, were not part of farm operator households and were adults. The median household income is calculated using data that have not been adjusted for family size.

Also consistent with expectations, owners without mortgages have the lowest STIRS. When examining the probability of ever spending 30% or more of household income on shelter, at only 5.2%, owners without mortgages are in a class of their own, far below the 26% of the next lowest tenure group of Canadians, owners changing their mortgage status.

While the 36% of Canadians who are owners with mortgages have about the same probability as market renters as a group of ever exceeding the affordability benchmark, they do so under totally different circumstances. Table 8 shows that owners with mortgages had the highest median incomes at $79,306, and also the highest median shelter costs, at $15,282. Having the highest incomes, owners with mortgages are better able to afford to pay a higher percentage of income on shelter. The high payments of owners include mortgage interest as well as mortgage principal.[7] In contrast, market renters had median incomes which were only half those of owners with mortgages, but median shelter costs that were more than half.

While the nearly 10% of households that changed tenure during the three year study period had a relatively high probability of ever spending 30% or more of income on shelter, they had a lower probability of doing so on a persistent basis. The reasons for this are likely complex. It may be that their tenure change is associated with short term high STIRs but that, in the longer term (in this study, over a period of three years), their situation improves. The change in tenure may be associated with such varied circumstances as a move that temporarily increases shelter costs faster than income or a move to adjust to family breakup and a drop in income.

3.3 Toronto and Vancouver residents stand out

"Location, location, location", so often heard in real estate, can also be used about shelter costs. Housing costs are highest in Canada's largest metropolitan areas. Are these higher costs reflected in higher probabilities of exceeding the housing affordability benchmark in these cities? The model suggests that Canadians living in Vancouver and Toronto, two of the largest and the two most expensive cities in Canada, have significantly higher probabilities of ever and persistently exceeding the affordability benchmark compared to people living in Ottawa-Gatineau, the reference category.

Table 9 presents median household STIRs, shelter costs and incomes for the metropolitan areas in this study. It shows that Torontonians shoulder the highest median shelter cost of all metropolitan areas, but do so on one of the highest median incomes, which mitigates their STIRs, leaving Torontonians with the second highest STIR. At 21%, it is Vancouverites that have the highest median STIR.

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7. The principal portion of a mortgage payment helps to build equity and therefore household wealth. The breakdown of mortgage payments into principal and interest is often not known by respondents and is not asked on SLID. Owners with mortgages who spend 30% or more of their income on shelter (i.e., they do not meet the affordability benchmark) are, unlike renters, contributing to their wealth.

Canadians living in Montreal, Calgary, Edmonton, other CMAs and rural areas have about the same probability of spending above the housing affordability benchmark as Ottawa-Gatineau residents. Residents of Victoria, accounting for the smallest population share of all the centres in the study, have a relatively high probability (28%) of ever spending 30% or more of household income on shelter. However, in terms of persistently exceeding the affordability benchmark, they are not significantly different from Ottawa-Gatineau.

Finally, as noted earlier, people living in households whose circumstances change tend to have higher STIRs. Results show that Canadians who move between metropolitan areas have a significantly higher probability (28.0%) of ever exceeding the affordability benchmark than those living throughout the study period in Ottawa-Gatineau (the reference category). But in terms of always exceeding the benchmark, results show that movers are not significantly different. Possibly it just takes time to find a good job and affordable shelter in a new city.

Table 9 Median shelter-cost-to-income-ratio (STIR), shelter cost and income by metropolitan area, 2002 to 2004

Metropolitan area	Median shelter-cost-to-income-ratio	Median shelter cost	Median household income
	%	$	$
Vancouver	21.0	12,047	65,089
Moved between places	19.7	9,680	56,468
Toronto	19.0	12,976	76,758
Calgary	17.5	11,742	74,805
Victoria	16.3	8,260	69,814
Edmonton	16.1	10,189	72,551
Montreal	15.9	8,120	57,405
Other CMAs	15.8	8,369	60,863
Ottawa-Gatineau	15.7	11,025	79,436
Rural	13.5	5,842	51,286

Note: Estimates based on the household records of people that were used in the model who were present for all three years of the study period, lived in households with incomes and shelter costs greater than zero, were not part of farm operator households and were adults. The median household income is calculated using data that have not been adjusted for family size.

3.4 Family-related transitions an important factor in housing affordability

Family living arrangements are not static. Various events can result in changes in family composition, for example, marriage, divorce, separation, death, and the departure or return of grown-up children. Between 2002 and 2004, 13% of the population changed from one family type category to another. In order to study and compare families that changed to those that did not, a separate category was created. [8]

Table 10 shows median shelter costs and incomes for each family type, ordered by the value of the shelter cost-to-income-ratio. Female lone-parent families have the highest STIRs at 27%, followed by women and men living alone. All three of these groups have median incomes that are less than half of that of couple families. Those living alone have median shelter costs that are less than two-thirds of those of couples, but female lone-parents pay almost 80% of what couples pay for shelter – which is why their STIRs are the highest.

Table 10 Median shelter-cost-to-income-ratio (STIR), shelter cost and income by family type, 2002 to 2004

Family type	Median shelter-cost-to-income-ratio	Median shelter cost	Median household income
	%	$	$
Female lone parent	26.8	8,180	30,504
Women living alone	25.6	5,817	22,870
Men living alone	22.3	6,187	30,813
Changed family type	19.8	9,041	55,176
Couple family	14.9	10,300	74,311
Other family type (includes male lone parents)	14.7	7,312	55,594

Note: Estimates based on the household records of people that were used in the model who were present for all three years of the study period, lived in households with incomes and shelter costs greater than zero, were not part of farm operator households and were adults. The median household income is calculated using data that have not been adjusted for family size.

Couple families, the most common family type, account for 66% of all people in Canada. For couples, the probability of living in a household ever spending more than the affordability benchmark is 16% and the probability of doing so persistently is just 3%, both comfortably below the national average. Couple families benefit from having the

8. Family type categories used in the models are: couple families, female lone-parents, women living alone, men living alone, other family type and changed family type. Categories are assigned to individuals based on all members of the family, even though children aged less than 16 are not included in the models. Also, households with more than one economic family are not part of this study. Couple families include those with and without children (under 18). This category includes married, common-law and same-sex relationships. Female lone-parent families include at least one child and the mother must be younger than 65. The category "other family type" includes male lone-parent families and couples or lone-parent families with other relatives living with them. Those who changed family type during the three-year period could have married, separated or divorced, had a death in the family, had children turn 18, or had relatives (including children 18 or over) leave home or take up residence with them.

highest median income of all family types which offsets their high shelter costs, giving them almost the lowest median STIR.

In contrast, those living in the remaining family types are significantly more likely ever to spend 30% or more of income on shelter – especially female lone-parent families and women living alone. Families in these two categories also have the highest probabilities of persistently spending above the benchmark. These smaller families are not able to benefit from the possibility of having more than one income (whether from government transfers or a salary). Perhaps even more important, the average earnings of employed women are still substantially lower than those of men, even when they are employed on a full-time basis. In 2003, women working on a full-time, full-year basis had average earnings of $36,500, or 71% what their male counterparts made.[9]

Those whose family type changed deserve special mention. Like those who moved or changed tenure, their probability of ever exceeding the benchmark is elevated. It is much higher than for couples, though not as high as for women living alone and female lone-parents. Their probability of always exceeding the benchmark is also significantly higher than for couples, though not by much. Perhaps people in families who add or lose members are able to make adjustments that reduce their STIRs after a year or two, whereas women living alone or bringing up children by themselves do not have such flexibility.

3.5 Recent immigrants and visible minorities have high probabilities of ever spending more than the housing affordability benchmark

More than 70% of immigrants who arrived in Canada since 1982 belong to a visible minority group.[10] For this reason, the findings for recent immigrants and visible minorities are discussed together.[11]

The high proportion of recent immigrants who are also visible minorities is not the only pertinent similarity between these two groups. Both also tend to live in Canada's largest urban centres where shelter costs are highest. For example, in 2001, 86% of immigrant households compared to 58% of non-immigrant households lived in Canada's census metropolitan areas (CMAs).[12] Both groups are more likely than Canadians in general to live in Toronto and Vancouver. In 2001 the share of visible minority Canadians living in

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9. *Women in Canada: A Gender-based Statistical Report*, 2005 Catalogue No.89-503-XPE.
10. Canada Mortgage and Housing Corporation, forthcoming. *2001 Census Housing Series: Canada's Visible Minorities*. Research highlights Socio-Economic Series, forthcoming. Ottawa: Canada Mortgage and Housing Corporation.
11. Immigrants are those born outside Canada and who have been given the right to live in Canada permanently by immigration authorities. Visible minority status is defined based on three questions: mother tongue, ethnic or cultural group of ancestry, and country of birth. Recent immigrants are defined based on the "years since immigration" variable. For this report, those who immigrated in the 20 years before 2002 are recent immigrants. Those who immigrated in the 9 years before 2002 are the most recent immigrants.
12. Canada Mortgage and Housing Corporation.(2004). *2001 Census Housing Series: Immigrant Households*. Table 2, p.2. Research highlights Socio-Economic Series 04-042 Ottawa: Canada Mortgage and Housing Corporation.

households in these two CMAs was four times larger than the share of Canadians who were not part of a visible minority. Just over 40% of all visible minorities compared to 11% of Canadians who were not visible minorities lived in Toronto while in Vancouver the comparable percentages were 18% and 5%.[10]

Another similarity between visible minorities and recent immigrants is the size of their families. The average size of visible minority families in 2002 was 3.8 compared to 2.9 for families that were not visible minorities. Similarly, the average size of recent immigrant families was 3.7 for those in Canada less than 10 years and 3.9 for those in Canada for 10 to 19 years. For the Canadian-born, the average family size was lower at 3.0 (tables 11 and 12). Larger families require larger accommodations, pushing up shelter costs. However, larger families can also generate more income, through the efforts of additional earners or from transfer payments. In fact, tables 18 and 19 show that, while median household incomes are similar for those who are visible minorities and those who are not, and for immigrants (except for the very recent ones) and Canadian-born, shelter costs are much higher for visible minorities and recent immigrants.

Given their tendency to live in the largest, most expensive cities and their larger family sizes, it is not surprising that both recent immigrants and visible minorities have significantly higher probabilities of living in households spending 30% or more of income on shelter at least once during the three-year study period. For immigrants (including visible minorities and those who are not), this higher probability declines with the length of time they have lived in Canada, with those who have spent 40 years or more in Canada having probabilities not significantly different from the Canadian-born. Immigrants who had lived in Canada for less than 10 years had the highest probability of ever exceeding the affordability benchmark at 39%. This probability drops to 23% for those in Canada for 40 or more years.

Results are similar for immigrants persistently exceeding the affordability benchmark. Recent immigrants are significantly more likely than the Canadian-born to exceed the benchmark and this probability drops off with the number of years in Canada until there is no significant difference from the Canadian-born. For visible minorities however, there is no significant difference between them and those who are not visible minorities in the probability of persistently exceeding the affordability benchmark.

Thus, locating in Canada's largest cities and living in larger families can increase shelter costs for visible minorities and recent immigrants. It can also contribute to higher incomes since cities offer more job opportunities and larger families can generate more income. For visible minorities, the probability of ever exceeding the affordability benchmark is significantly higher than for non-visible minorities, although the probability of persistently exceeding it is not. For recent immigrants, both probabilities are elevated compared to the Canadian-born, especially for the most recent immigrants who had been in Canada for less than 10 years at the beginning of the study. These most recent arrivals are also the group whose income is quite a bit lower than other immigrant groups. If they go on to follow the pattern of immigrants who came before them, they will gradually increase their incomes and reduce their shelter costs and family sizes. This in turn would

reduce their STIRs and their probabilities of exceeding the affordability benchmark. Future studies should examine this group more closely.

Table 11 Median shelter-cost-to-income-ratio (STIR), shelter cost and income by visible minority status, 2002

	Median shelter-cost-to-income-ratio	Median shelter cost	Median household income	Average family size
	%	$	$	#
Visible minority	21.1	12,111	61,949	3.8
Not visible minority	15.9	8,728	62,898	2.9

Note: Estimates based on the household records of people that were used in the model who were present for all three years of the study period, lived in households with incomes and shelter costs greater than zero, were not part of farm operator households and were adults. The median household income is calculated using data that have not been adjusted for family size.

Table 12 Median shelter-cost-to-income-ratio (STIR), shelter cost and income by year since immigration, 2002

Years	Median shelter-cost-to-income-ratio	Median shelter cost	Median household income	Average family size
	%	$	$	#
0 to 9	25.6	12,756	49,300	3.7
10 to 19	20.8	12,800	64,522	3.9
20 to 29	17.7	11,537	73,813	3.4
30 to 39	14.4	7,975	73,143	3.0
40 and more	14.1	6,316	49,245	2.3
Canadian born	16.0	8,852	63,435	3.0

Note: Estimates based on the household records of people that were used in the model who were present for all three years of the study period, lived in households with incomes and shelter costs greater than zero, were not part of farm operator households and were adults. The median household income is calculated using data that have not been adjusted for family size.

3.6 Aboriginal households are more likely to spend more than the affordability benchmark, but not persistently

Unlike immigrants, Aboriginals living off reserve[13] do not congregate in Toronto and Vancouver. Only 11% of Aboriginal Canadians lived in these two CMAs compared to 22% of non-Aboriginals. This difference in location likely accounts for the lower median shelter costs they report, $8,286 compared to $9,088 for non-Aboriginal Canadians. But their lower shelter costs are associated with even lower incomes resulting in STIRs that are higher than for non-Aboriginals (table 13).

13. Those in the Aboriginal category indicated at least one of the following: that they were a Treaty Indian or a Registered Indian as defined by the Indian Act of Canada; or that their ancestors were Cree, Micmac, Métis or Inuit. This method of defining Aboriginal is different from the Census. In the Census an identity approach is taken and those in the Aboriginal category answered yes to at least one of the following: that they were an Aboriginal person; that they were a member of an Indian Band or First Nation; or that they were a Treaty Indian or a Registered Indian as defined by the Indian Act of Canada. The SLID definition gives a higher estimate for off reserve Aboriginals: 629,000 (aged 16 and over) in reference year 2001 compared to 471,000 (aged 15 and over) on the 2001 Census. The reason for SLID's higher estimate is that it includes those with Aboriginal ancestry.

Table 13 Median shelter-cost-to-income-ratio (STIR), shelter cost and income for Aboriginals and non-Aboriginals, 2002

	Median shelter-cost-to-income-ratio	Median shelter cost	Median household income
	%	$	$
Aboriginal	19.0	8,286	50,365
Not Aboriginal	16.4	9,088	63,206

Note: Estimates based on the household records of people that were used in the model who were present for all three years of the study period, lived in households with incomes and shelter costs greater than zero, were not part of farm operator households and were adults. The median income is calculated using data that have not been adjusted for family size.

Results from the two models show that Aboriginals living off reserve are significantly more likely than non-Aboriginals ever to exceed the affordability benchmark, but no more likely to do so persistently. Aboriginals have a higher rate of moving than non-Aboriginals. The percentage of Aboriginals that moved during the three year study period is 17.4%, compared to 12.4% for non-Aboriginals, and, as already seen; households that move are more likely to exceed the affordability benchmark.

Results discussed above showed that Canadians moving between metropolitan areas had a significantly higher probability of ever exceeding the affordability benchmark but, in terms of always exceeding the benchmark, they were not significantly different. Perhaps it is the higher mobility of Aboriginal Canadians that causes them to have a similar pattern to movers. As noted above, it may take time to find a good job and affordable shelter in a new city.

On the other hand, other characteristics of Aboriginal housing include higher rates of crowding or unsuitable housing as measured by the National Occupancy Standard[14] and higher rates of living in a dwelling unit in need of major repairs. See table 14. It may be that Aboriginals are living in inadequate or unsuitable accommodation to lower their rents. This is an area that merits further study.

14 Overcrowded dwellings do not have enough bedrooms for the size and make-up of resident households, according to National Occupancy Standard (NOS) requirements. Enough bedrooms based on NOS requirements means one bedroom for each cohabiting adult couple; unattached household member 18 years of age and over; same-sex pair of children under age 18; and additional boy or girl in the family, unless there are two opposite sex siblings under 5 years of age, in which case they are expected to share a bedroom. A household of one individual can occupy a bachelor unit (i.e. a unit with no bedroom). The NOS, developed by a Federal/Provincial/Territorial Working Group to be the suitability standard for use in the core housing need model, embodies the common elements of standards in place by different provincial and territorial housing agencies across Canada. For more information on the role of the NOS in defining acceptable housing and in the measurement of core housing need, see Core Housing Need in Canada, 1991, Canada Mortgage and Housing Corporation. Pgs.3-7.

Table 14 Percentage in housing that is crowded or in need of major repairs

	Aboriginal	Non-Aboriginal
	%	%
Crowded	8.53	6.58
Needing major repairs	10.47	5.92

3.7 Disabled more likely to exceed affordability benchmark

Those who self-identified as disabled at least once during the three year study period have significantly higher probabilities than the non-disabled of ever or always exceeding the affordability benchmark. The disabled are also more likely to live in families where the major source of income comes from government transfers (including old age security) and not wages and salaries (table 15).

Table 15 Major source of household income for disabled and non-disabled

Major source of income	Disabled	Non-disabled
	%	%
Wages and salaries	47.2	71.2
Government transfers	24.1	5.7

Table 16 Median shelter-cost-to-income-ratio (STIR), shelter cost and income for the disabled and the non-disabled, 2002

	Median shelter-cost-to-income-ratio	Median shelter cost	Median household income
	%	$	$
Disabled	17.1	7,425	51,274
Not disabled	16.2	10,116	69,999

Note: Estimates based on the household records of people that were used in the model who were present for all three years of the study period, lived in households with incomes and shelter costs greater than zero, were not part of farm operator households and were adults. The median household income is calculated using data that have not been adjusted for family size.

3.8 Higher education linked to higher earning power and lower STIRs

As would be expected, compared to those who received some kind of post-secondary certification other than a BA, those with less education have significantly higher probabilities of ever or persistently exceeding the affordability benchmark. Similarly, those with more education (BA, or post graduate degrees) have significantly lower probabilities of doing so. (table 17).

Table 17 Median shelter-cost-to-income-ratio (STIR), shelter cost and income by education level, 2002

	Median shelter-cost-to-income-ratio	Median shelter cost	Median household income
	%	$	$
Below high school	16.9	6,801	45,691
Graduated high school	16.6	8,807	59,200
Some PSE without cert	17.2	9,706	65,597
Some PSE with cert	16.3	9,455	65,431
Bachelor's degree	14.7	11,231	85,584
Postgraduate degree	13.5	12,115	97,039
Unknown	18.3	10,053	61,497

Note: Estimates based on the household records of people that were used in the model who were present for all three years of the study period, lived in households with incomes and shelter costs greater than zero, were not part of farm operator households and were adults. The median income is calculated using data that have not been adjusted for family size.

4.0 Conclusion

In this report, the traditional cross-sectional analysis of housing affordability using shelter cost-to-income ratios (STIRs) has been extended by adding an examination of longitudinal data. Until this report, all studies on housing affordability in Canada were cross-sectional in nature, i.e., referring to a specific point in time, often to a single year.

The report begins by drawing on 2002 through 2004 SLID cross-sectional data to show that the proportion of Canadians living in households spending above the affordability benchmark of 30% at any one point in time — in any single year — tends to be stable at around one in five or 20%. It then capitalizes on SLID's longitudinal capabilities to study the dynamics of housing affordability of Canadians over a longer period of time by creating longitudinal estimates of housing affordability for the same three year period.

While cross-sectional data indicate a stable 20% of Canadians living in households spending above the affordability benchmark for shelter in any single year, longitudinal data give a broader perspective. When measured over a three year period, 28% of Canadians reported ever living in a household exceeding the affordability benchmark, indicating that this situation is more prevalent than shown by cross-sectional estimates alone.

Another way of looking at this is to divide those who ever exceeded the benchmark into those who did so for one year (12%), for two years (7%) and for all three years (9%). This shows that roughly one-third of those exceeding the benchmark at least once during the study period can be considered to be persistently doing so, while the other two-thirds are moving in and out of this state. However, a three-year study period is rather short. Some of the seemingly transient group may be ending or starting a prolonged period of exceeding the benchmark. When more years of data are available, we should be able to understand more about the dynamics of these households.

To identify the factors associated with spending above the affordability benchmark, two logistic regression models were run. They examined the correlates of a Canadian living in a household either "persistently" (all three years) or "ever" (at least one year) exceeding a STIR of 30%. Both models corroborated the findings from the cross-sectional and longitudinal analyses presented in the descriptive section of this report. They found the attributes associated with the highest probabilities of living in a household spending above the affordability benchmark were: living alone, being a female lone parent, renting, being an immigrant, and living in Vancouver or Toronto.

In addition, the "ever" regression model contributed the important finding that those living in households experiencing some kind of transition during the study period have a higher probability of exceeding the benchmark at least once during the study period. Such transitions included renters with a change in rent subsidy status, those who changed housing tenure from owner to renter or vice versa, those who changed family type, for example, by marrying or divorcing, and those who moved between the cities examined in this study. Perhaps equally important was the finding that those experiencing these transitions did not do so persistently.

The models also show that renters in subsidized housing for all three years of the study period, while experiencing probabilities similar to market renters of exceeding the benchmark for at least one year, had lower probabilities of persistently doing so. This was in spite of having a median income approximately half that of market renters.

To conclude, the longitudinal capability of SLID enhances our understanding of housing affordability in two key ways:

- First, the proportion of Canadians ever living in households spending 30% or more of their before-tax household income on shelter is considerably larger than that indicated by traditional cross-sectional data. This study's three year panel data for 2002-2004 identifies almost 50% more Canadians experiencing these conditions over three years than did so in any single year according to traditional cross-sectional data; and

- Second, the majority (about two-thirds) of Canadians reporting ever living in households spending above the 30% STIR benchmark do not do so on a persistent basis year over year, but rather on an occasional basis, and that often the factors associated with their being in a household spending 30% plus are associated with some kind of transitional change.

This study, the first to explore the SLID longitudinal shelter cost data, was designed to advance our knowledge of patterns of affordability and build a base upon which further research can be carried out.

Appendix A Data source

Survey of Labour and Income Dynamics (SLID)

SLID is a household survey that uses computer-aided telephone interviews to collect information on income, labour, education and, since 2002, housing. Between January and March, interviewers collect information from the previous calendar year regarding respondents' labour experiences and income, educational activity, and family relationships. Demographic characteristics of family and household members, and information about their dwellings and shelter costs represent a snapshot as of the end of each calendar year The response rate averaged 77.3% during the three-year study period covered in this report. SLID covers all individuals in Canada, excluding residents of the three territories, residents of institutions and persons living on Indian reserves or in military barracks, and those who are homeless. Overall, these exclusions amount to less than three percent of the population.

The samples for SLID are selected from the monthly Labour Force Survey (LFS) and thus share the latter's sample design. The LFS sample is drawn from an area frame and is based on a stratified, multi-stage design that uses probability sampling. The total LFS sample is composed of six independent samples, called rotation groups, because each month one sixth of the sample (or one rotation group) is replaced. The SLID sample is composed of two panels. Each panel consists of two LFS rotation groups - roughly 17,000 households. A panel is surveyed for a period of six consecutive years. A new panel is introduced every three years, so two panels always overlap.

Analysts can use SLID data to produce both cross-sectional and longitudinal estimates. Cross-sectional estimates provide a snapshot of the situation in a given year. Longitudinal estimates are based on a longer period of up to six years although housing data have not yet been collected for the entire period. The longitudinal estimates in this report are based on data from two panels whose results were analyzed as a whole: the last three years of panel 3 and the first three years of panel 4.

Comparability with census data

Table 18 shows the percentage of households spending 30% or more of their total household income on shelter. Of these cross-sectional estimates, those for 2001 are based on the Census and those for 2002-2004 are based on SLID. Generally, the SLID and Census estimates correspond well.

Table 18 Percentage of households spending 30% or more of total before-tax household income on shelter costs, 2001 to 2004 (Cross-sectional data)

	Census	Survey of Labour and Income Dynamics (SLID)		
	2001	2002	2003	2004
		percent		
Total	24.1	23.5	23.7	24.0
Renters	39.6	39.2	40.0	39.8
Owners	16.0	15.9	16.1	17.1

Note: Households with shelter, shelter-cost-to-income-ratio (STIRs) equal to or greater than 100% ***are included***. Roughly 3% of households have such STIRs. Normally, Canada Mortgage and Housing Corporation (CMHC) excludes these households from its affordability studies since it is difficult to interpret the financial circumstances of these households. Possible reasons for STIRs being greater than 100% include: different reference periods for shelter and income; collected shelter costs are too high (perhaps because, if there is a business operated from home, there is difficulty separating shelter costs from business expenses); fluctuations in self-employment income; and the household having revenue other than standard income to put towards shelter

Appendix B Shelter-cost-to-income-ratio (STIR) and the affordability standard

Owner shelter costs include mortgage payments[15], property taxes, condominium fees, and utility payments[16] (for heating fuel, water and electricity). Renter shelter costs consist of rent payments plus utilities. Total annual household shelter costs are derived from this information for comparison to total annual before-tax household income. Before-tax income includes transfers from government but does not subtract taxes. Income is collected for each person 16 years of age and over and then aggregated into household income. Approximately 85% of SLID respondents allow the use of their tax data as an alternative to answering the survey questions, thereby improving data quality and reducing response burden.

Households spending less than 30% of their incomes on shelter are classified as meeting the affordability standard. Households spending 30% or more of their incomes on shelter are classified as not meeting the affordability standard but are not necessarily experiencing housing affordability problems. Many who spend a higher percentage of their incomes on shelter do so by choice, and have sufficient income to be able to afford suitable and adequate housing for less than 30% of their incomes in their locality.

The CMHC indicator "Core Housing Need" classifies only those who could not afford suitable and adequate housing in their locality as being in housing need. Based on the application of this indicator to 2001 Census data by CMHC, 20% of *households* spent more than the housing affordability standard, but only 12% were in core housing need.[17] This report looks only at the 30% affordability benchmark.

15. The principal portion of a mortgage payment helps to build equity and therefore household wealth. However, the breakdown of mortgage payments into principal and interest is often not known by respondents and is not asked on SLID. Thus, owners with mortgages who spend 30% or more of their income on shelter (i.e., they do not meet the affordability benchmark) are, unlike renters, contributing to their wealth.
16. Utility costs are imputed onto the SLID database for both renters and owners based on Census data.
17. Canada Mortgage and Housing Corporation. 2004. *2001 Census Housing Series: Issue 3 Revised - The Adequacy, Suitability, and Affordability of Canadian Housing, Appendix Table 4, p. 9.* Research highlights Socio-Economic Series 04-007. Ottawa: Canada Mortgage and Housing Corporation https://www.cmhc-schl.gc.ca/odpub/pdf/63403.pdf

Appendix C The study universe

As already stated, this report presents both cross-sectional and longitudinal estimates. To conduct longitudinal analysis, it is necessary to work at the person level and not at the household level since the household universe is dynamic. Households form, change, and dissolve due to birth, marriage, divorce, death, and the comings and goings of household members, making it difficult to follow households over time. Therefore, household characteristics (including shelter costs, incomes, and STIRs) are attached to each SLID household member.

Analytical results are presented on a person basis by reporting on the numbers and percentages of people living in households with the various characteristics. To facilitate comparisons between longitudinal and cross-sectional estimates, most of the cross-sectional analysis in Section 2 was also done at the person level.

Certain exclusions from the survey population are necessary. Table 19 shows how many people were excluded and the reason for exclusion. The first step, for longitudinal analysis only, was to eliminate those persons not present for all three survey years.

To make it easier to interpret results, people living in the following households were also excluded: (a) those with household incomes or shelter costs less than or equal to zero, (b) those where a household member operates a farm, and (c) those with more than one economic family, i.e., where at least one person in the dwelling was not related by blood, marriage or adoption. These three exclusions removed approximately 8% of the sample from cross-sectional analysis with the largest exclusion coming from the third criterion.

Positive incomes and shelter costs are essential to interpret the shelter cost-to-income ratio (STIR). Households can report negative incomes when, for instance, income from self-employment or investment includes losses that are larger than gains. Such households usually depend on alternative monetary sources such as loans, savings or capital gains. But these data are not collected in SLID, so it is not possible to assess how much money the household has to live on. Similarly, it is difficult to interpret the STIR if a household reports that it pays nothing for shelter when, for example, the use of a dwelling comes as part of employment compensation.

Farm operators are excluded because their shelter costs and farm operating costs may be so blended together that it is hard to obtain a reliable estimate of the actual shelter cost.

The exclusion of households with more than one economic family was done because the members of some of these households may make their housing decisions at the family or individual level and any household level estimate might be difficult to interpret[18]. For example, in a roommate household, each of the roommates would have different incomes, although they might share the rent equally. A STIR calculated based on their

18. A household consists of all the people living in a dwelling, whereas an economic family consists only of those who are related by blood, marriage or adoption living together in a dwelling.

total shelter costs and the sum of their incomes may not have the same meaning as a STIR calculated for a family or individual living alone.

Finally, the two models presented in Section 3 were run only on the adult (aged 16 and over) population, because certain questions such as Aboriginal status, immigration status and education level are not asked of those under age 16. See table 19 for a summary of the derivation of the universes.

Table 19 Derivation of study universes: weighted counts of persons

	Cross-sectional universe[1]			Longitudinal universe[1]	
	(section 2)			(section 2)	(section 3)
	2002	2003	2004	2002 to 2004	2002 to 2004
			number		
Estimated number of persons from SLID	30,610,947	30,893,075	31,174,809	28,950,145	28,950,145
After excluding those not present all three years (longitudinal analysis only)	...	...	...	27,107,455	27,107,455
After excluding those with negative or zero household incomes or shelter costs	30,568,370	30,835,231	31,102,100	26,992,822	26,992,822
After excluding those in farm operator households	29,977,252	30,233,333	30,506,003	26,310,812	26,310,812
After excluding those in households with more than one economic family	28,378,713	28,646,902	28,911,771	25,011,041	25,011,041
After excluding those aged less than 16 (model in section 3 only)	...	...	...	...	19,893,968

... not applicable

1. The cross-sectional universe includes both longitudinal people (those who were part of the panel when it was initiated) and cohabitants (those who joined longitudinal people during the course of the panel), whereas the longitudinal universe only includes people present at the beginning of each panel.

Appendix D Sample distribution for the models

Two regression models were developed to explore the question, "Who is likely to spend 30% or more of income on shelter costs?"

The goal of the first model was to compare the characteristics of those who ever (at least one year) spend 30% or more of household income on shelter to those who never do. The sample was divided into the *ever* group (with STIR at or above the 30% benchmark for at least one year between 2002 and 2004) and the *never* group (with STIR never at or above the 30% benchmark during all three years).

In the second model, the goal was to focus on the population which persistently spends 30% or more of household income on shelter, in this case for the full 3-year study period. The sample was divided into the group *persistently* spending 30% or more of their income for shelter and the *never + occasionally* group (with STIR below the 30% benchmark for at least one year during the three-year period).

Model 1 regresses the *ever* indicator and Model 2 regresses the *persistently* indicator against the socio-demographic and geographic characteristics of Canadians and the households in which they live. See tables 20 and 21 for more information about how the sample has been divided into the *ever* and *persistently* groups.

Note that the models exclude those aged less than 16 because certain questions such as Aboriginal status, immigration status and education level are not asked of children. Note also that income was not included in the models because it is part of the calculation of the characteristic of interest –the STIR.

Table 20 Sample distribution – Model 1: Ever spends 30% or more

Canadians who live in households	Persons in the sample (unweighted)	Estimated persons (weighted)	Percentage of total (weighted)
	number	number	%
Never spending 30% or more of income on shelter	32,442	14,451,901	72.6
Ever (at least one year) spending 30% or more of income on shelter	**9,782**	**5,442,067**	**27.4**
Total	42,224	19,893,968	100.0

Table 21 Sample distribution – Model 2: Persistently spends 30% or more

Canadians who live in households	Persons in the sample (unweighted)	Estimated persons (weighted)	Percentage of total (weighted)
	number	number	%
Never and occasionally (one or two years) spending 30% or more of income on shelter	39,530	18,274,721	91.9
Persistently (all three years) spending 30% or more of income on shelter	**2,694**	**1,619,247**	**8.1**
Total	42,224	19,893,968	100.0

Appendix E The variables

The tenure, geographic and demographic variables outlined below are factors that may be correlated with housing affordability and therefore were included in the models.

Tenure

Owners - with mortgage all 3 years

Owners - without mortgages all 3 years

Owners - with a change in mortgage status during the three-year period

Renters - subsidized all 3 years

Renters - market rent (reference category)

Renters – with a change in the rent subsidy status during the three-year period

Changed tenure - refers to those who both owned and rented during the three-year period

Geography

Toronto

Vancouver

Montreal

Ottawa/Gatineau (reference category)

Calgary

Edmonton

Victoria

Other Census Metropolitan Areas, Census Agglomerations, or small urban centres

Rural

Changed - refers to those who had moved between any of the above places during the three-year period

Age group

16 to 19

20 to 29

30 to 49 (reference category)

50 to 64

65 and above

- based on age in 2002

Disability status

Disabled in any of the three years

Not disabled in any of the three years (reference category)

- respondents assess whether they have any difficulty doing any of the activities of daily living and whether they have a physical condition or mental condition or health problem that reduces the amount or kind of activity they can do at work, at school, at home, etc.
- don't know and refusals are re-coded as non-disabled

Aboriginal status

Aboriginal

Non-Aboriginal (reference category)

- only off-reserve aboriginals are covered in SLID
- don't know and refusals are re-coded as non-Aboriginal in this study
- Those classified in SLID as Aboriginal (629,000 off reserve Aboriginals aged 16 and over) indicated at least one of the following: that they were a Treaty Indian or a Registered Indian as defined by the Indian Act of Canada; or that their ancestors were Cree, Micmac, Métis, Inuit or other Aboriginal groups. Thus, SLID classifies persons as Aboriginal using ancestry as well as a partial measure of identity. In contrast, the Census estimate used most often is based on identity rather than ancestry. For the Census identity approach, those in the Aboriginal category have to have answered yes to at least one of the following: that they were an Aboriginal person; that they were a member of an Indian Band or First Nation; or that they were a Treaty Indian or a Registered Indian as defined by the Indian Act of Canada. The Census identity approach resulted in 471,000 Aboriginals aged 15 and over.

Visible minority

Visible minority

Not visible minority (reference category)

- don't know and refusals are re-coded as not visible minority
- Visible minority status is defined based on three questions: mother tongue, ethnic or cultural group of ancestry, and country of birth

Immigrants: Years in Canada before 2002

0 to 9

10 to 19

20 to 29

30 to 39

40 or more

Non-immigrant (reference category)

- based on number of years in 2002
- don't know and refusals are re-coded as non-immigrant

Family type

Couple family (reference category)

Women living alone

Men living alone

Female lone-parent

Other family type

Changed family type

- based on family situation all three years
- "changed" refers to changes in family type between any of the three years
- the major income earner is used as the reference person in the derivation of this variable

Education

Below high school

Graduated high school

Some post-secondary education without certificate

Some post-secondary education with certificate (reference category)

Bachelor's degree

Postgraduate degree

- based on the highest level of education as of 2002

Appendix F The models

The logistic regression models estimate the odds ratio of event Y conditional on a given set of characteristics X as follows:

Odds ratio = prob(Y|X)/(1- prob(Y|X) = exp(Xβ) ,

where β is the vector of parameter of interest.

With a simple transformation, the probability of event Y given X can be recovered easily:

Prob(Y|X)= 1/(1+exp(Xβ))

The probability of spending 30% or more of household income on shelter for at least one year between 2002 and 2004 (model 1) and the probability of spending 30% or more of household income on shelter all three years (model 2) can be derived based on characteristics X. To look at the effect of a particular variable on these two probabilities, all other variables are set to their mean values. Since all explanatory variables are categorical, their mean values would be equivalent to their share in the weighted sample.

For instance, to hold the effect of disability constant when looking at city effect, $X_{disabled}$ is set to 0.365 and $X_{non\text{-}disabled}$ is set to 0.635 to reflect the disability composition of the sample. The same technique is applied to all other variables, except for X_{city} where the city of interest will be given a 100% weight and all other cities will not be given any weights. This provides the same basis for doing cross city comparisons.

Each model was run with a number of different combinations of variables and the estimates were relatively stable. The results of the most general models are presented in this report. Table 7 presents the estimated probabilities for these models.

The variable "total household income" was not included in the models because it is part of the calculation of the characteristic of interest i.e., the STIR.